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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/756,397	01/14/2004	Patrick Chiu	114890	3512

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OLIFF & BERRIDGE, PLC
P.O. BOX 19928
ALEXANDRIA, VA 22320

EXAMINER

LAY, MICHELLE K

ART UNIT PAPER NUMBER

2672

DATE MAILED: 06/28/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/756,397	CHIU ET AL.	
	Examiner	Art Unit	
	Michelle K. Lay	2672	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 June 2004.
 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-41 is/are pending in the application.
 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
 5) ☐ Claim(s) _____ is/are allowed.
 6) ☒ Claim(s) 1-41 is/are rejected.
 7) ☐ Claim(s) _____ is/are objected to.
 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
 10) ☒ The drawing(s) filed on 09 June 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☐ All b) ☐ Some * c) ☐ None of:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>4.15.04</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Objections

1. Claim **1** is objected to because of the following informalities: the word 'of' needs to be inserted between 'plurality' and 'tiles' on line 3. Appropriate correction is required.
2. Claim **16** is objected to because of the following informalities: the word 'line' should be 'link' on line 2. Appropriate correction is required.

Drawings

3. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference characters "S202" in Fig. 16 and "S204" in the specification [0052] line 4 have both been used to designate the step to input new or updated set of data. Reference characters "S209" in Fig. 16 and "S809" in the specification [0053] line 3 have both been used to designate the step of selecting the first or next new tile as current the current tile. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and

informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

4. The disclosure is objected to because of the following informalities: Reference to 'Fig. 12' in [0069] line 3, [0074] line 1, [0075] line 1, and [0078] line 2 should be 'Fig. 20'. Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims **1, 2, 4, 6 – 19, 21 – 27, and 29 – 41** are rejected under 35 U.S.C. 102(e) as being anticipated by Barg et al. (US Patent No. US 6,707,454 B1).

In regards to claims **1, 2, 4, 6, 7, 12, 13, 23, 30, 31 –**

Barg et al. discloses a system and invention for visualizing multi-dimensional databases. Referring to Fig. 2, the three-dimensional single measure perspective (100) is used to visualize the pivot table shown in Fig. 1 [column 6, lines 18 – 23] and is

displayed using a standard graphical user interface (claim **23**: graphical user interface) [column 6, lines 46 – 48]. The pivot table data is flattened to two-dimensions and is used as input data to the 3D single measure perspective shown in Fig. 2 (claim **1**: inputting a first set of data to be visualized) [column 6, lines 26 – 28]. Looking at Fig. 2, one can see a grid along the x-axis created by the x- and y-axes. This grid creates tiles along the x-axis, i.e. ground plane (claim **23**: ground plane defined by a plurality of tiles), where the data from the pivot table shown in Fig. 1 defines the margin for the x- and y-axis (claim **1**: defining tiles based on the data model). The first link as claimed in claim **1** would be the positive values within the pivot table and as shown, is displayed above the x-axis, i.e. ground plane (claims **1**, **23**: first link displayed above the ground plane). Similarly, the second link as claimed in claim **1** would be the negative values within the pivot table and is shown below the ground plane, i.e. x-axis (claims **1**, **23**: second link displayed below the ground plane). Both the positive and negative representations are linked to the tiles by their values from the pivot table, i.e. an X value, Y value and weight (claims **1**, **23**: link related to tile) [column 6, lines 29 – 34]. The measure, i.e., the quantity displayed at the intersection of the dimensions, is used as the value/weight of the glyphs that extend along the z-axis (claims **2**, **4**, **29**: defining the distance above and below the ground plane). The weight determines the size of the glyphs (claims **6**, **7**, **30**, **31**: defining the size of the first and second links) [column 6, lines 32 – 34]. It should be appreciated that any graphical representation of aggregated data on a dimensional basis can be used in the dimensional view portion in place of the bar chart views shown in Fig. 2. For example, another common dimensional view is the pie chart view, line

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charts, hierarchical charts, bubble plots and the like (claims **12**, **13**: defining the shape of first and second link) [column 7, lines 20 – 26].

In regards to claims **29**, **40**, **41** many limitations of this claim closely follow those of claim 1. Therefore, only differences will be addressed. –

Fig. 29 is a block diagram outlining the system of Barg et al. The multi-dimensional data structures data visualizing systems can be implemented using a general purpose computer (700). The general purpose computer (700) includes an input-output interface (710), a controller (720), a memory (730), and a display (750), each connected to an internal data/control bus (790). A selection device (740) is connected to the input-output interface (710). The memory (730) includes an input multi-dimensional data structure storage portion (732), and may include an output multi-dimensional data structure storage portion (734) [column 29, lines 7 – 23]. The multi-dimensional data visualization system (800) is implemented as one or more software routines or programs executed on the general purpose computer (700) (claim **41**: storage medium storing a set of program instructions) [column 30, lines 3 – 8]. The multi-dimensional visualization system (800) includes a data input circuit or routine (810) (claim **29**: height determining circuit, routine, or application), a display controller circuit or routine (820), a data/color/selection state table (830) and a data output circuit or routine (840) [column 30, lines 10 – 13]. The display controller circuit or routine (820) will update the various perspectives to display only those rows that match the input page value from the user (claim **40**) [column 32, lines 46 – 49].

In regards to claims **8, 9, 34, 35** –

Referring again to Fig. 2, by interactively selecting and labeling the largest bars, both in the positive (first link) and negative (second link) directions, extreme values can be highlighted (claims **8, 9, 34, 35**: defining brightness of the first and second link) [column 5, lines 44 – 45].

In regards to claims **10, 11, 16, 17, 18, 21, 27, 32, 33** –

Figs. 6 and 7 displays the toolbar (130) of Fig. 2 used in the graphical user interface of Barg et al. The “Color By” control (502) and (602) allow the user to select which dimension or measure is used to color all the views (claims **10, 11, 32, 33**: defining the color of the first and second link) [column 14, lines 25 – 27]. Furthermore, the multi-dimensional data visualization systems and methods of Barg et al. include a dimensional focus navigational control portion and technique (116) for manipulating the rows, columns, and pages that are visualized in the various perspectives [column 15, lines 56 – 63]. The user can rearrange the dimensions after visualizing a pivot table or other multi-dimensional data structure, by swapping rows, columns, and pages (claims: **16, 17, 27**: switching first and second link) [column 16, lines 1 – 5]. Thus, by manipulating the rows and columns, the data set for the first and second link would switch locations, resulting in the negative glyphs (second link) to be displayed above the x-axis, i.e. ground plane, and the positive glyphs (first link) to be displayed below the x-axis, i.e. ground plane (claim **17**: second link displayed above and first link displayed

below the ground plane). To rearrange the dimensions within the dimensional views portion, the user clicks on the slider corresponding to one of the dimensions and drags the corresponding slider to a new area [column 16, lines 19 – 22]. The dimensions arranged along the column and row axes of the multiscape view change to reflect the new arrangement of the dimensions (claim **18**: updating the visualization) [column 16, lines 28 – 32]. These buttons are manipulated by the user via the graphical user interface to define the attributes of the data (claim **21**: defining a value of at least one attribute of the first link).

In regards to claim **19** –

The display controller circuit or routine (820) will update the various perspectives to display only those rows that match the input page value from the user (claims **19**) [column 32, lines 46 – 49]. In other words, only updating the new input values from the user.

In regards to claims **14, 15, 37 – 39** –

Referring to Fig. 3, the same three dimensions which correspond to the dimension of the original pivot table as shown in Fig. 2. Thus, the dimensional view portions of Fig. 3 include the same three bar chart views as in Fig. 2 [column 10, lines 47 – 52]. The lines representing the parallel coordinates view are drawn between the box plot views of the weighted parabox view to connect the measure values (claims **14, 15, 37 – 39**: paths) [column 10, lines 63 – 66].

In regards to claim **22** –

As shown in Fig. 2, the totals table shows the sum of that measure for all data items in the data pool, the sum of that measure of that measure for the selected items and the percent of the entire data set. Some measure can have both positive (first link) and negative (second link) values. The data item with positive values are separated from the data items with negative values. The data items with positive values are summed separately from the data items with negative values, and the positive and negative data items are listed separately under the corresponding positive and negative columns (claim **22**: averaging first and second link)[column 7, lines 57 – 68, column 8, lines 1 – 3].

In regards to claim **24** –

Referring to Fig. 2 of Barg et al., one can see within the interactive dimensional views (112) on the left side of the 3D single measure perspective (122), space between each bar of the graphs. The one-dimensional views are displayed in the dimensional view portion for each dimension of the selected measure [column 7, lines 2 – 4]. Therefore, if extracting the 1D view from the 3D view, the spaces between the bars seen in the 1D view result from spaces within the 3D view.

In regards to claims **25, 26** –

As shown in Fig. 2, the multiscape view also includes its own toolbar (160). The toolbar includes an "Arbitrary Rotation" button (166) [column 8, lines 15 - 20] that allows the user arbitrarily rotate the three-dimensional multiscape view about an arbitrary axis, (claim 26), a "Top-Down/Bottom-Up View" button (161), a "Horizontal View" button (162), a "Home Position View" button (163), and a "Pan" button (167). All of which would allow the user to change the viewpoint of the 3D visualization (claim 25).

In regards to claim 36, the rationale provided in the rejection of claim 29 is incorporated by reference herein. –

A user may sweep out regions on the views. The items in the swept-out region become the selection set and are drawn in color. The unselected items are then redrawn in gray (claim 36: marking and unmarking tiles) [column 14, lines 49 – 52]. Thus the display controller circuit or routine (820), a data/color/selection state table (830) and a data output circuit or routine (840) of the Multi-dimensional data visualization system (800) implemented as one or more software routines or programs executed on the general purpose computer (700) would be used for such an event.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims **3**, **5**, **28** are rejected under 35 U.S.C. 103(a) as being unpatentable over Barg et al. (US Patent No. US 6,707,454 B1).

In regards to claims **3** and **5**, the rationale from claim 1 is incorporated as reference herein. –

Barg et al. teaches the limitations of claims **3** and **5** with the exception of disclosing a group of users defining a quantifiable quality. However, the system of Barg et al. utilizes a general-purpose computer (700) as shown in Fig. 29. The link (910) can be any known or later developed structure for connecting the multi-dimensional data source (900) to the general purpose computer (700), such as a direct cable connection, a connection over a local area network or a wide area network, a connection over a distributed network, such as the Internet, an intranet, an extranet or any other known or later developed distributed network system or the like [column 29, lines 25 – 39]. The link (910) would provide access to the multi-dimensional data source (900) to multiple users with access to the different types of networks. Referring to Fig. 2, the measure, i.e., the quantity displayed at the intersection of the dimensions, is used as the value/weight of the glyphs that extend along the z-axis. This value/weight would be a quantifiable quantity that would be defined from the pivot tables created by the user locally, or users via access to the different types of networks.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to allow a group of users to define a quantifiable quantity because if the pivot tables used correspond to dimensional databases to organize business metrics, multiple data from different departments would be needed to be

inputted into the pivot tables for analysis. Thus, by allowing a group of users to do so, reduces the amount of time and effort for having only a single user carry out the task.

In regards to claim **28**, the rationale from claim 23 is incorporated as reference herein. --

Barg et al. teaches the claimed limitations of claim **28** with the exception of disclosing superimposing the second link on top of the first link. However, Figs. 6 and 7 of Barg et al. displays the toolbar (130) of Fig. 2 used in the graphical user interface. The multi-dimensional data visualization systems and methods include a dimensional focus navigational control portion and technique (116) for manipulating the rows, columns, and pages that are visualized in the various perspectives [column 15, lines 56 – 63]. The user can rearrange the dimensions after visualizing a pivot table or other multi-dimensional data structure, by swapping rows, columns, and pages [column 16, lines 1 – 5]. Thus, by manipulating the rows and columns, the data set of the second link can be superimposed on top of the first link by specifying the negative hemisphere to be viewed on the positive hemisphere. Therefore, it would have been obvious to one of ordinary skill in the art to superimpose the second link on top of the first link to provide a means for analysis of the two data sets.

7. Claim **20** is rejected under 35 U.S.C. 103(a) as being unpatentable over Barg et al. (US Patent No. US 6,707,454 B1) in view of Sacerdoti et al. (US Patent No. US 6,188,403 B1).

Barg et al. teaches the limitations of claim **20** with the exception of disclosing creating the second data set via interaction with the visualization. However, Sacerdoti et al. teaches a 3D graphics generation and display application that allows the user to interact with the graphics display.

Barg et al. discloses a system and invention for visualizing multi-dimensional databases. Claim 1 is incorporated as reference herein. Referring to Fig. 2, the three-dimensional single measure perspective (100) is used to visualize the pivot table shown in Fig. 1 [column 6, lines 18 – 23] and is displayed using a standard graphical user interface [column 6, lines 46 – 48]. The first link would be the positive values within the pivot table and as shown, is displayed above the x-axis, i.e. ground plane. Similarly, the second link would be the negative values within the pivot table and is shown below the ground plane, i.e. x-axis.

Sacerdoti et al. teaches a 3D graphics generation and display application that allows the user to interact with the graphics display. Referring to Fig. 4, the user can click on the graphics object (48) and move the object (48). When a graphics object (48) is moved or otherwise has one of its attributes changed, the system (10) of Fig. 1 simultaneously causes the underlying variable value in the database to be changed appropriately. Thus, the user can change the database by manipulating the graphics objects (48) [column 8, lines 44 – 49].

Therefore, it would have been obvious to one of ordinary skill in the art to incorporate the graphics manipulation of Sacerdoti et al. within data input circuit or routine (810) of the multi-dimensional visualization system (800) as carried out by the

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general-purpose computer (700) of Barg et al. because it would be easier for the user to visually interpret and manipulate the data set instead of trying to analyze and manipulate a pivot table, such as, for example, to see patterns, to identify trends, and to spot outliers due to the size and texture nature of pivot tables and other multi-dimensional data structures [Barg et al.: column 5, lines 12 – 15].

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michelle K. Lay whose telephone number is (571) 272-7661. The examiner can normally be reached on Monday - Friday, 7:00am - 3:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Razavi can be reached on (571) 272-7664. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

06.15.2005 mkl



6/15/05

RICHARD HJERPE
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600